



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,252	04/01/2004	Istvan Endre Lukacs	P25051	6976
7055	7590	02/03/2005	EXAMINER	
GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191			NGUYEN, SANG H	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/814,252

Applicant(s)

LUKACS ET AL.

Examiner

Sang Nguyen

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 07/29/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 07/29/04 has been entered. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **"converging lens"** in claims 8-9; the **"one of a converging and a diverging lens positioned in front of the sensor"** in claim 10; the **"at least one flat mirror is positioned between the light source and concave mirror"** in claim 11; the **"at least one mirror is positioned**

between the sample and concave mirror" in claim 14; the **"at least one flat mirror is positioned between the sensor and concave mirror"** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 10-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohno (U.S. Patent No. 4,705,940) in view of Prior Art of Present Invention (Figures 1-3)

Regarding claims 1-2, 6, 23-25, and 28; Kohno discloses an apparatus and method for fast, quantitative, non-contact topographic investigation of samples, comprising:

- a light source (IS of figure 1 and col.4 lines 12-15 or La of figure 7);
- a collimating concave mirror (M1 of figures 1 and 7) structured and arranged to produce a parallel beam (figures 1 and 7) and to direct the parallel beam to a sample (W of figures 1 and 7) to be investigated, wherein the samples comprise semiconductor wafers (W of figure 1 and col.3 lines 34-36);
- a structured mask (M of figures 1 and 7) located between the light source (IS of figure 1 or La of figure 7) and the concave mirror (M1 of figures 1 and 7); and
- a light receiving element (D of figure 7) structured and arranged to receive a beam reflected from the sample wafer (W of figure 7) and the concave mirror (M1 of figure 7), wherein relative positions of the mask (M of figure 7) and the light receiving element (D of figure 7) to other elements (figure 7) of the apparatus are chosen to provide an essentially sharp image of the mask on the light receiving element (D of figure 7). See figures 1-9.

Kohno discloses all of features of claimed invention except for an image sensor.

Art Unit: 2877

However, PAPI teaches that it is known in the art to provide a surface examination apparatus and method comprising a light receiving screen (3 of figure 1) is an image CCD camera or sensor (Page 2 lines 25-28).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify an apparatus and method for fast, quantitative, non-contact topographic investigation of samples of Kohno with an image sensor as taught by PAPI for the purpose of detecting accurately defect or scratch on the surface sample with imaging high sensitivity.

Regarding claim 3; Kohno teaches all of features of claimed invention except for the light source is a point source. However, PAPI teaches it is known in the art to provide the light source is a point source (1 of figure 3 and page 3 lines 27-29). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify an apparatus and method for fast, quantitative, non-contact topographic investigation of samples of Kohno with the light source is a point source as taught by PAPI for the purpose of emitting accurately the parallel light to the sample.

Regarding claims 4 and 26; Kohno teaches about the concave mirror (M1 of figures 1 and 7) is an off-axis parabolic mirror (figures 1 and 7).

Regarding claims 5 and 27; Kohno teaches all of features of claimed invention except for the structured mask is a quadratic grid. However, PAPI teaches that it is known in the art to provide the structured mask (2 of figure 2) is a quadratic grid (Page 3 line 14). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify an apparatus and method for fast, quantitative, non-

Art Unit: 2877

contact topographic investigation of samples of Kohno with the structured mask is a quadratic grid as taught by PAPI for the purpose of exposure area of accurate shape image to the sample.

Regarding claims 7 and 29; Kohno teaches about a converging lens considered to be a focus lens (Lc of figure 7) positioned in front of the light source (La of figure 7) and mask (M of figure 7) to be in a beam path (figure 7).

Regarding claim 10; Kohno teaches about converging or focus lens (Lr of figure 6) positioned in front of the sensor/camera (D of figure 6) to be in beam path.

Regarding claims 11-13 and 17-19; Kohno teaches at least one flat mirror (FM1 of figure 7) is positioned between the light source (La of figure 7) or the light receiving element (D of figure 7) and the concave mirror (M1 of figure 7) to fold an optical path, wherein the flat mirror (FM1 of figure 7) is partially transmitting mirror or semi-transparent mirror (figures 1 and 7, and col.3 lines 48-55).

Regarding claims 14-16 and 30; Kohno teaches at least one flat mirror (FM2 of figure 1) is positioned between the sample (W of figure 1) and the concave mirror (M1 of figure 1) to fold an optical path, wherein the flat mirror (FM2 of figure 1) is partially transmitting mirror or semi-transparent mirror.

Regarding claims 20-22; Kohno teaches the sensor considered to be the light receiving element coupled to a computer (CU of figure 7), wherein the computer (Cu of figure 7) for calculating a height (d or 2d of figure 7) of a given point of the sample (W of figure 7) from a position of an image point on the sensor (D of figure 7).

Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohno in view of Prior Art of Present Invention as applied to claim 1 above, and further in view of Kubota et al (U.S. Patent No. 5, 969,581).

Regarding claims 8-9; Kohno in view of Prior Art of Present Invention discloses all of features of claimed invention except for the light source comprises a laser and converging lens for providing a diverging beam. However, Kubota et al teaches that it is known in the art to provide the light source unit (10, 11 of figure 2) comprises a laser (10 of figure 2) and converging lens (11 of figure 2) for providing a diverging beam. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify an apparatus and method for fast, quantitative, non-contact topographic investigation of samples of Kohno with the light source comprises a laser and converging lens for providing a diverging beam as taught by Kubota et al for the purpose of transmitting light beam accurately to the sample with high speed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mende et al (5627639) discloses coded aperture imaging spectrometer; Sweatt (5512759) teaches condenser for illuminating a reingfield camera; Araki et al (5255116) discloses original scanning apparatus; Lee et al (5225890) discloses surface inspection apparatus; Piironen (5018867) discloses method and apparatus for the inspection of specularly reflective surfaces; Harada et al (4983039) discloses spectrometer; Sorimachi et al (4867570) discloses three dimensional

Art Unit: 2877

information processing method and apparatus; or Yoshimura et al (4568186) discloses operator selectable multiple mode spectrophotometer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Nguyen whose telephone number is (571) 272-2425. The examiner can normally be reached on 9:30 am to 7:00 pm.

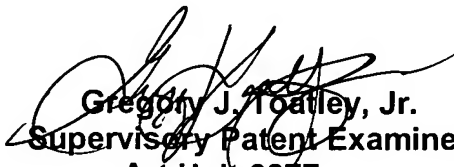
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SN

Sang Nguyen/SN

January 25, 2005


Gregory J. Toatley, Jr.
Supervisory Patent Examiner
Art Unit 2877
Technology Center 2800